



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/789,485

02/27/2004

Thilo Stolze

074313.0105

7994

7590

04/02/2008

Andreas Grubert
Baker Botts L.L.P.
One Shell Plaza
910 Louisiana
Houston, TX 77002-4995

EXAMINER

ARENA, ANDREW OWENS

ART UNIT

PAPER NUMBER

2811

MAIL DATE

DELIVERY MODE

04/02/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/789,485	Applicant(s) STOLZE, THILO	
	Examiner Andrew O. Arena	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,8,9 and 11-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8,9 and 11-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 8, 9, 12-17 and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ali (US 6,157,538)

RE claim 1, Ali discloses (e.g., Fig 4) a power semiconductor module (e.g., col 2 ln 31-51) comprising a plurality of semiconductor components (14, 16, 18; col 3 ln 25) situated on substrate regions (60, 62), wherein:

each substrate region (60, 62) has a top surface and side faces, wherein side faces of two adjacent substrate regions face each other; and

between each two adjacent substrate regions a connecting element (20) is arranged such that the connecting element directly contacts the side faces of the two adjacent substrates, wherein said connecting elements are designed to prevent a deformation of one substrate region to continue to an adjacent substrate region (Ali discloses claimed structure, capable of claimed function, see MPEP § 2114).

RE claim 2, Ali discloses the connecting regions are formed by recesses in a module housing (11) enclosing said substrate portions.

RE claim 3, Ali discloses the material recesses are slotted.

RE claims 8, 9 & 12, Ali discloses the module housing, at least in the regions of the substrate regions, is such that it acts on the substrate regions with a spring force (solids have inherent elastic modulus, and exert a spring force upon contact).

RE claim 13, Ali discloses (Fig 3) the power semiconductor module has a housing (11), which, in an area between the substrate regions, has action points (where 20 contacts 60/62) for a mechanical pressure application of the connecting regions, and the housing applies pressure to the individual substrate regions.

RE claim 14, Ali discloses (Fig 3) a power semiconductor module (In 1) comprising

a plurality of substrate elements (60, 62) having a top and bottom surface and sidewalls, each substrate element comprising a semiconductor component (14, 16, 18) arranged on the top surface of a substrate element;

one or a plurality of connecting regions (20) directly contacting opposing sidewalls of two adjacent substrate elements, wherein said connecting elements are designed to prevent a deformation of one substrate region to continue to an adjacent substrate region (Ali discloses claimed structure, capable of claimed function, see MPEP § 2114).

RE claim 15, Ali discloses a module housing (11) enclosing said plurality of substrate elements.

RE claim 16, Ali discloses the connecting elements are formed by recesses.

RE claim 17, Ali discloses the material recesses are slotted.

RE claim 19, Ali discloses the module housing, at least in the regions of the substrate regions, is such that it acts on the substrate regions with a spring force (solids have inherent elastic modulus, and exert a spring force upon contact).

RE claims 20 & 22, Ali discloses a heat sink (66; col 3 ln 51) having a flat (top) surface, wherein a bottom surface of the plurality of substrate elements (60, 62) and said plurality of connecting regions are arranged on said flat surface.

RE claim 21, Ali discloses the module housing (32) in a region between the substrate elements comprises action points (where 20 contacts 60/62) for a mechanical pressure application of the connecting elements, and the housing applies pressure to the individual substrate regions (ln 5-6).

RE claim 23, Ali discloses (Fig 4) a power semiconductor module (e.g., col 2 ln 31-51) comprising:

- a heat sink (66; col 3 ln 51) having a flat (top) surface;
- a plurality of substrates (60, 62) arranged on the fiat surface of the heat sink;
- a plurality of semiconductor components (14, 16, 18) arranged on the substrates;
- one or a plurality of connecting regions (20) in direct contact with adjacent ones of the substrates and arranged directly on the flat surface of the heat sink between adjacent ones of the substrates, wherein the connecting regions are designed to prevent a deformation of one substrate to continue to an adjacent substrate (Ali discloses claimed structure, capable of claimed function, see MPEP § 2114).

Claim Rejections - 35 USC § 103

Claims 4, 5, 11, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ali as applied to claims 1, 2, and 14 above, and further in view of Mikio (JP Pub 2001-118987).

RE claims 4, 5 & 18, Ali differs from the claimed invention only in not expressly disclosing the substrate is a ceramic.

Mikio discloses an analogous device on a ceramic substrate.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that in Ali, in view of Mikio, the substrate regions are ceramic; at least for high heat dissipation (JPO machine translation of Mikio: ¶3).

RE claim 11, Ali discloses (Fig 3) the module housing, at least in the regions of the substrate regions, is such that it acts on the substrate regions with a spring force (solids have inherent elastic modulus, and exerts a spring force on contact).

Response to Arguments

Applicant's arguments filed 12/19/2007 have been considered but are moot in view of the new grounds of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of time extension as per 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is 571-272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571- 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. For more info about PAIR, see <http://pair-direct.uspto.gov>. For questions PAIR access, contact the Electronic Business Center at 866-217-9197 (toll-free). For assistance from a USPTO Customer Service Rep or access to the automated info system, call 800-786-9199 or 571-272-1000.

/Andrew O. Arena/
Examiner, Art Unit 2811
31 March 2008

/Lynne A. Gurley/
Supervisory Patent Examiner, Art
Unit 2811